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FLUKE®

Instruction Sheet

80i-400

AC Current Probe

INTRODUCTION

The Model 80i-400 is a clamp-on ac current probe designed to extend the current measuring capability of an ac current meter to 400 amperes. A clamp-on, 1000-turn coil designed into the probe allows measurements to be made without breaking the circuit under test. The coil serves as the secondary of a current transformer. The current carrying conductor being measured serves as the primary.

SPECIFICATIONS

Input Current Range: 1A to 400A

Output: 1 milliamp per ampere of input current (1mA/A)

Accuracy: ±(3% + 0.4A) 48 Hz to 1000 Hz

Working Voltage: 660V ac rms maximum

Maximum Conductor Size: 1 ea. 30 mm (1.18") or 2 ea. 25 mm (0.98")

Shunt (load) Resistance: less than 12 ohms at multimeter input to maintain specified accuracy

Typical Bandwidth: -10% at 40 Hz and 5 kHz (1A, 400 Hz reference, excludes multimeter response)

Usable Current Range: 0.1A to 600A, 5 seconds maximum above 400A

Safety: Protection Class II as defined in IEC 348 and ANSI C39.5

MULTIMETER COMPATIBILITY

The 80i-400 is compatible with any multimeter capable of reading ac current equal to 1/1000 of the current to be measured, and equipped with input jacks compatible with Fluke safety-designed test lead connectors. To take full advantage of the probe's accuracy, a multimeter ac current accuracy of ±0.75% or better is recommended. A voltmeter fitted with an external shunt will qualify as a suitable current meter. However, to ensure the probe's accuracy, the shunt (or multimeter input resistance in ac current) should be less than 12 ohms. This requirement is met on Fluke DMMs when using a current range of 20 mA or greater.

When making a measurement, the current-carrying conductor is not broken, and remains electrically isolated from the current meter input terminals. As a result, the current meter's INPUT LO or COM terminal may be either floated (isolated) or grounded.

METER READINGS

When the 80i-400 is connected to a compatible current meter and clamped around a single current-carrying conductor, the meter reading will be one 1000th of the actual current in the conductor. For example, a 5-ampere (A) input current will be transformed into a 5 milliampere (mA) output current (see Figure 1).

When measuring current in an ac line cord, the jaws should be clamped around only one conductor (the black or hot wire in a three wire cord). If the jaws are clamped around both current carrying conductors, the currents will cancel and produce a zero reading.

If the probe is clamped around two wires carrying current in the same direction, the sum will be read. Reversing one of the wires causes the difference to be read.

LOW-LEVEL CURRENT MEASUREMENTS

The 80i-400 AC Current Probe is specified to measure currents of 1A or greater. Currents less than 1A will produce meter readings that are below the true value. Low-level currents can be measured by looping the input wire through the jaws so that the sum of the current through the jaws is greater than 1A. The actual current can then be calculated by dividing the meter reading by the number of turns looped through the jaws.

For example, to measure a current of 400 mA (0.4A), form a 10-turn loop and clamp the jaws of the 80i-400 around all 10 turns. The meter reading will be 4 mA, which corresponds to a primary current of 4A. The actual current in the conductor is 4A divided by 10-turns, or 400 mA.

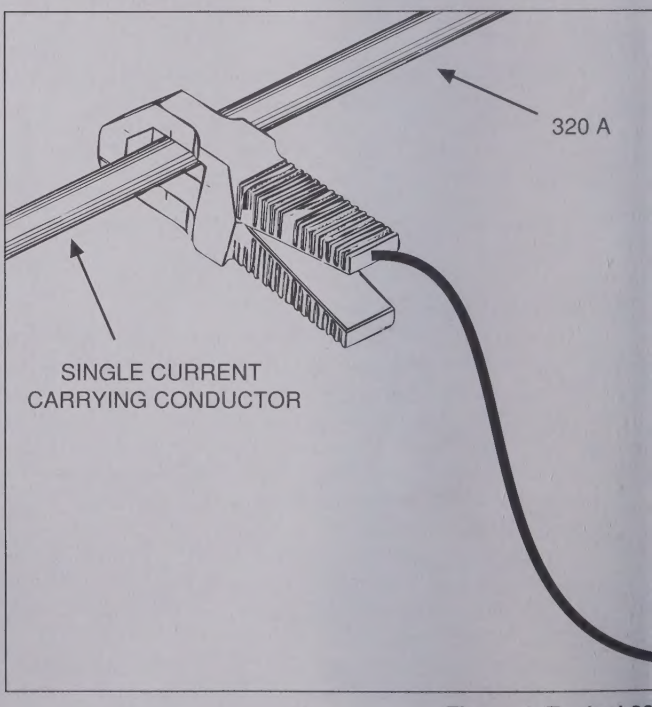


Figure 1. Typical 80

NOTE

The range selection on the meter should always be 20 mA or greater (12 ohm shunt or lower). Lower ranges with higher shunt values will cause reading errors.

OPERATION

1. Connect the 80i-400 output connectors between the common and the appropriate current input jack of a suitable meter, then switch the meter on.

NOTE

Refer to Table 1 to determine the appropriate input jack and proper function setting for use with a Fluke handheld DMM.

2. Select a 20 mA ac or greater current range.

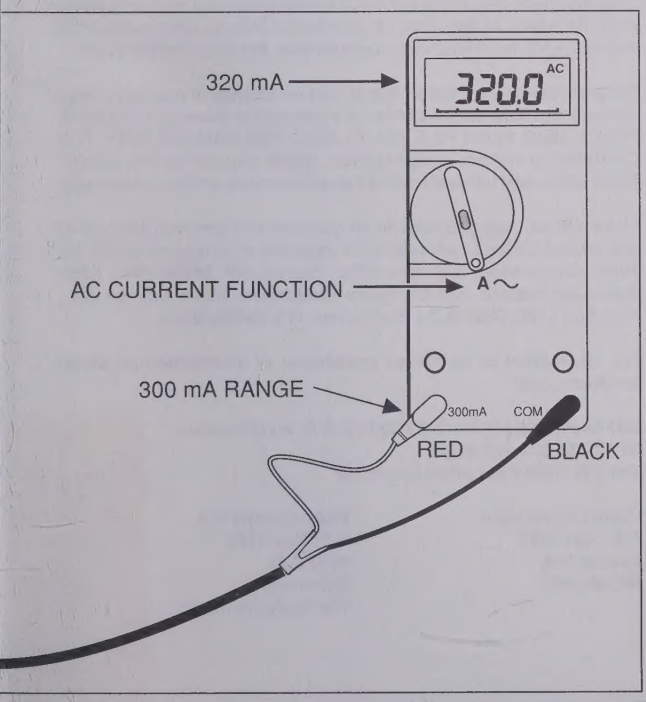
3. Clamp the probe around the current-carrying conductor to be measured (see Figure 1). Make sure the probe jaws are tightly closed around the conductor. The probe is designed for highest accuracy when the conductor is centered on the jaw alignment marks.

4. Multimeter readings displayed in milliamps (mA) can be read directly as amperes of input current. Readings displayed in amperes (A) must be multiplied times 1000 to obtain the amperes of input current.

MAINTENANCE

Performance Test

Verify the probe accuracy by measuring the output of a 20A (±0.2%), 60 Hz current source (Fluke 5100B and 5220A or equivalent). When used with a compatible DMM



) Using a Typical Meter

with ± 0.75% or better ac current accuracy (Fluke 8060A or equivalent), the probe should measure 20.00A ± 1.00A (20.00 mA, ± 1.00 mA) with the conductor centered on the jaw alignment marks. No calibration adjustments are provided.

Cleaning

Use a soft cloth dampened in a mild solution of detergent and water to clean the 80i-400. Do not use solvents. A light coating of dripless oil on the jaw surfaces will prevent corrosion.

Table 1. Clamp/Meter Setup Guide

FLUKE MODEL	INPUT JACK (for red lead)	FUNCTION
21	10A (limited to 320A)	A~
23, 21 Series II, 23 Series II	300 mA (10A on Model 23, Series II Models 21 & 23 for > 320A)	A~
25,27	mAμA	mA/A~
75,77, 75 Series II, 77 Series II	300 mA (10A on all Models 75 & 77 for > 320A)	A~
29,79 Series II	40 mA (10A for ≥ 40A)	A~
83,85,87	mAμA	mA/A~
8060A,8062A	A	AC~,A *
8020A,8020B, 8021B,8022A, 8024A,8024B, 8026B	mA	AC~, mA *

* 20mA range for up to 20A
200mA range for up to 200A
2000mA range for up to 400A

WARRANTY

Fluke Corporation (Fluke) warrants this product to be free from defects in material and workmanship under normal use and service for a period of 1 year from date of shipment. Software is warranted to operate in accordance with its programmed instructions on appropriate Fluke products. It is not warranted to be error free. This warranty extends only to the original purchaser and shall not apply to fuses, computer media, batteries or any product which, in Fluke's sole opinion, has been subject to misuse, alteration, abuse or abnormal conditions of operation or handling.

Fluke's obligation under this warranty is limited to repair or replacement of a product which is returned to an authorized service center within the warranty period and is determined, upon examination by Fluke, to be defective. If Fluke determines that the defect or malfunction has been caused by misuse, alteration, abuse, or abnormal conditions of operation or handling, Fluke will repair the product and bill the purchaser for the reasonable cost of repair. If the product is not covered by this warranty, Fluke will, if requested by purchaser, submit an estimate of the repair costs before work is started.

To obtain repair service under this warranty purchaser must forward the product, (transportation prepaid) and a description of the malfunction to the nearest Fluke Service Center. The product shall be repaired at the Service Center or at the factory, at Fluke's option, and returned to purchaser, transportation prepaid. The product should be shipped in the original packing carton or a rigid container padded with at least four inches of shock absorbing material. FLUKE ASSUMES NO RISK FOR IN-TRANSIT DAMAGE.

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For application or operation assistance or information on Fluke products, call:

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PN 735191
June 1984 Rev. 4, 4/94
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